

CHARACTERIZING THE SURVEY STRATEGY AND INITIAL ORBIT DETERMINATION ABILITIES OF THE NASA MCAT TELESCOPE FOR GEOSYNCHRONOUS ORBITAL DEBRIS ENVIRONMENTAL STUDIES

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ABSTRACT

The NASA Orbital Debris Program Office (ODPO) recently commissioned the Meter Class Autonomous Telescope (MCAT) on Ascension Island with the primary goal of obtaining population statistics of the geosynchronous (GEO) orbital debris environment. To help facilitate this, studies have been conducted using MCAT's known and projected capabilities to estimate the accuracy and timeliness in which it can survey the GEO environment. A simulated GEO debris population is created and sampled at various cadences and run through the Constrained Admissible Region Multi Hypotheses Filter (CAR-MHF). The orbits computed from the results are then compared to the simulated data to assess MCAT's ability to determine accurately the orbits of debris at various sample rates. Additionally, estimates of the rate at which MCAT will be able produce a complete GEO survey are presented using collected weather data and the proposed observation data collection cadence. The specific methods and results are presented here.

